



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------------|------------------|
| 10/660,467 | 09/11/2003 | Takahiro Usui | 9319G-000559 | 4958 |
| 27572 | 7590 | 11/22/2005 | | |
| HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303 | | | EXAMINER NGUYEN, LAMSON D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2861 | |

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/660,467

Applicant(s)

USUI, TAKAHIRO



Examiner

Lamson D. Nguyen

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment dated 09/13/05
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 8 and 10-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8, 10-13 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7-8, 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (6,431,674) in view of Inada Genji (JP08-216425).

Suzuki et al teaches a method of driving a film forming apparatus

comprising:

Claim 1:

- controlling the vibrations by a first signal that causes liquid drops to be discharged (column 5, lines 13-19)
- controlling the vibrations by a second signal that does not cause liquid drops to be discharged (column 1, lines 37-41) and that imparts a shear rate to the liquid that lowers a viscosity of the liquid (column 16, lines 37-41)
- wherein the liquid is a non-Newtonian, pseudoplastic fluid body (column 16, lines 37-41 disclose that velocity is increased to increase the fluidity of ink. Applicant discloses that non-Newtonian fluids have a viscosity that depends on shear rate, which is velocity related. Pseudoplastic fluids decrease in viscosity as mixing increases, which is taught by Suzuki in column 13, lines 36-38)

Claim 2:

- wherein the second signal is transmitted before the first signal is transmitted
(figure 10 teaches a non-print signal before a print signal)

Claim 3:

- Wherein the second signal is transmitted after the first signal is transmitted
(figure 10 also teaches a non-print signal after a print signal)

Claim 4:

- wherein the second signal is transmitted at least once after a time when the first signal is transmitted and before a time when the first signal is transmitted again (figure 18a where printing takes place until the deceleration period T6, where the meniscus minutely vibrates (column 14, lines 37-40) until the rest time of the carriage T7 after which the meniscus minutely vibrates again the in carriage acceleration period T3, where it is then suspended T4, after which printing again takes place in T5 or figure 10)

Claim 7:

- forming a film on a substrate (column 2, lines 4-5) as a result of liquid drops being discharged by a liquid drop discharge apparatus (column 1, lines 5-7)

Claim 8:

- a liquid drop discharge apparatus that discharges liquid drops (column 1, lines 5-7)
- a pressure generating chamber provided in the liquid drop discharge apparatus, imparting vibrations to a liquid (column 1, lines 53-55)
- a pressure generating device provided in the pressure generating chamber (column 2, lines 37-38)
- a control device that controls the pressure generating device such that vibrations are imparted to the liquid (column 2, lines 38-41)
- a first signal that causes the liquid drops to be discharged (column 5, lines 13-19; figure 10)
- a second signal that does not cause the liquid drops to be discharged (column 1, lines 37-41) and that imparts a shear rate to the liquid that lowers a viscosity of the liquid (column 16, lines 37-41)
- wherein the liquid is a non-newtonian, pseudoplastic fluid body (column 16, lines 37-41 disclose that velocity is increased to increase the fluidity of ink. Applicant discloses that non-Newtonian fluids have a viscosity that depends on shear rate, which is velocity related. Pseudoplastic fluids decrease in viscosity as mixing increases, which is taught by Suzuki in column 13, lines 36-38)

Claim 10:

- wherein the pressure generating device is a piezoelectric element that causes the liquid drops to be discharged by imparting vibrations to the pressure generating chamber (column 4, lines 30-33)

Claims 12-13:

- a film forming apparatus that forms a film on a substrate (column 2, lines 4-5) as a result of liquid drops being discharged from a liquid drop discharge apparatus wherein the film forming apparatus is the apparatus according to claim 8 (column 1, lines 5-7)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Imanaka et al. (US 6,409,300).

Art Unit: 2861

Suzuki teaches all claimed features of the invention except the pressure generating device comprises a foam generating apparatus that causes the liquid drops to be discharged by generating foam in the liquid, and a control apparatus that controls a driving of the foam generating apparatus such that the generated foam expands or contracts

Meanwhile, Imanaka teaches:

- wherein the pressure generating device comprises a foam generating apparatus that causes the liquid drops to be discharged by generating foam in the liquid (column 12, lines 65-66), and a control apparatus that controls a driving of the foam generating apparatus such that the generated foam expands or contracts (column 1, lines 43-44)

Therefore, it would have been obvious to one of ordinary skill in the art to use thermal energy instead of a piezoelectric element, as they are equivalent means of ejecting ink drops.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 09/13/05 have been fully considered but they are not persuasive.

On page 9, second paragraph of the applicant's arguments, the applicants argue that "Suzuki discloses adjusting a rising gradient and a falling gradient in accordance with the ambient temperature, so as to control the viscosity of the ink used by the inkjet recording apparatus. This is significantly different than the applicant's claimed invention". The examiner disagrees and likes to point out that current claims 1 and 8 fail to claim the inventor's invention, and they they do not disclose teaching the applicant's arguments. Specifically, the alleged teaching of "the shear rate of a non-newtonian pseudo plastic fluid body is increased if vibrations are imparted thereto, resulting in the viscosity thereof being lowered, and even the viscosity of a fluid body that has a high degree of viscosity can be lowered without that fluid body being heated" is not being claimed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


Art Unit: 2861

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamson D. Nguyen whose telephone number is 571-272-2259. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Talbott can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


LAMSON NGUYEN
PRIMARY EXAMINER
11/21/05